Strabismus Surgery at the Puerto Rico Medical Center: a Brief Report

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Objective: We undertook a retrospective study to evaluate strabismus surgeries done at the University Hospital and at the University Pediatric Hospital of the Puerto Rico Medical Center.

Methods: The surgery schedules ranging from January 2003 to December 2007 were reviewed. Three types of strabismus were evaluated, including esotropia, exotropia, and hypertopia. Differences in the distribution of strabismus type according to age group and gender were assessed using the extension of the Fisher's exact test.

Results: A total of 120 patients were included (56 males and 64 females); the patients ranged in age from 4 months to 70 years (average: 15.1 years. Analysis of the distribution of strabismus type showed that 63 (52.5%) had esotropia; 49 (40.8%) had exotropia; 4 (3.3%) had hypertropia; 3 (2.5%) had both hypertropia and exotropia; and 1 (0.9%) had both hypertropia and esotropia. Both esotropia and exotropia were significantly ($p<0.0001$) more common in children than they were in adults; however, hypertropia and combined strabismus types were more common in adults than they were in children. There was no statistical ($p>0.05$) significance found upon analyzing strabismus distribution according to gender.

Conclusion: Among patients with this eye disorder at the Puerto Rico Medical Center, the most common type of surgically treated strabismus was esotropia. Further studies will elucidate the prevalence of strabismus in Puerto Rico. [*P R Health Sci J 2011;30:203-205*]

Key words: Strabismus, Esotropia, Exotropia

Strabismus is defined as any ocular misalignment (1). It has been associated both with abnormalities of the neuromuscular control of eye movements and with extraocular muscle pathology (1). Strabismus is a common disorder that affects up to 4 percent of preschool children in the United States (2).

The various types of strabismus are named according to the direction of the ocular misalignment. Esotropia, exotropia, and hypertropia (2) are described by an inward, outward, or vertical (upward) ocular manifest deviation, respectively. Patients with strabismus have poor fusion control (3).

Strabismus is associated with amblyopia. Patients with esotropia are more likely to develop amblyopia (4). This likelihood may be due to a disruption in the development of binocular vision, causing reduced stereopsis (5). In children, the latter may lead to poor visual-motor skills (5). Amblyopia is the most common cause of monocular visual impairment in both children and young and middle-aged adults (6). In the United States, amblyopia has an estimated prevalence of less than 2% percent in both White and African American pediatric patients (7-8).

Even though the prevalence of strabismus has been studied in various populations, it remains unknown in Puerto Rico. We report on the three major types of strabismus treated surgically at the Puerto Rico Medical Center.

Methods

A retrospective study was done by evaluating surgical schedules (which schedules included dates ranging from January 2003 to December 2007) at the University Hospital and at the University Pediatric Hospital of the Puerto Rico Medical Center.

Specifically, strabismus surgeries were evaluated. Data were analyzed in terms of age and gender. For the purpose of the study, children were labeled as patients younger than 18 years old and adults as those who were 18 years old or older. Summary statistics were computed to describe the strabismus type, age and gender of patients. Differences in the distribution of strabismus type according to age group and gender were assessed using the extension of the Fisher's exact test.

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Results

One hundred and twenty patients underwent strabismus surgery. Patients' ages ranged from 4 months to 70 years (mean = 15.1 years). There were 56 (46.7%) male and 64 (53.3%) female patients.

Patients were grouped according to strabismus type: 63 (52.5%) had esotropia; 49 (40.8%) had exotropia; 4 (3.3%) had hypertropia; 3 (2.5%) had both hypertropia and exotropia; and 1 (0.9%) had both hypertropia and esotropia.

There was a significant ($p<0.0001$) difference found when an analysis of the age distribution of strabismus was performed (Table 1). Both esotropia and exotropia were more common in children than they were in adults. However, hypertropia and combined strabismus types were more common in adults than they were in children. There was no statistical ($p>0.05$) significance found upon analyzing strabismus distribution according to gender.

Table 1. Distribution of strabismus type by age and gender among 120 patients treated surgically at the Puerto Rico Medical Center, 2003-2007.

	Esotropia (n=63)	Exotropia (n=49)	Hypertropia (n=4)	Combined types* (n=4)	*p* value†
Age					
<18	57 (90.5)	38 (77.6)	1 (25.0)	1 (25.0)	<0.0001
≥18	6 (9.5)	11 (22.4)	3 (75.0)	3 (75.0)	
Gender					
Male	30 (47.6)	22 (44.9)	1 (25.0)	3 (75.0)	>0.05
Female	33 (52.4)	27 (55.1)	3 (75.0)	1 (25.0)	

*Combined types include esotropia and hypertropia (1) and exotropia and hypertropia (3). †P value calculated using the extension of the Fisher's exact test.

Discussion

Previous studies have reported that the most common types of strabismus that lead to surgery are esotropia and exotropia (9-10). In our study, esotropia was the most frequent type of strabismus (45.8%) leading to surgery. Exotropia was the second-most type (33.3%) leading to strabismus surgery. These findings are compatible with those of previous reports. However, they differ from those of reports from Chile, (11) where exotropia is the leading diagnosis associated with strabismus surgery.

A multi-ethnic study from the United States reports that strabismus increases with age in the Latino population (12). In this study, exotropia and esotropia were more common in children than they were in adults. This finding differs from previous studies of Latino populations done in the continental United States.

Ferreira and co-workers (13) explain that there are as yet no statistically significant reports exploring the role of gender in the etiology of strabismus. In our study, no statistical significance was found in the distribution of strabismus according to gender, either. This finding is consistent with previous reports.

Several factors may contribute to a higher frequency of strabismus in Puerto Rico. The island's geographic isolation may increase the possibility of hereditary factors leading to strabismus. Further, previous reports show an elevated number of premature infants born in the island, (14) and strabismus is associated with such premature birth (15).

Limitations of the study include the retrospective nature of the analysis. Further, because the study focused on operating room schedules (thus, not including non-surgically treated strabismus patients), the sample size may have been restricted. The potential public health implications of this study are important. Further studies are needed to accurately quantify the prevalence of strabismus in Puerto Rico.

Resumen

Objetivo: Se realizó un estudio retrospectivo evaluando los itinerarios de cirugías de estrabismo del Hospital Universitario y del Hospital Universitario Pediátrico del Centro Médico de PR, desde enero de 2003 a diciembre de 2007. Métodos: Se evaluaron tres tipos de estrabismo: esotropía, exotropía e hipertropía. Las diferencias en la distribución del tipo de estrabismo según la edad y el género se evaluaron mediante la extensión de la prueba exacta de Fisher. Resultados: Un total de 120 pacientes (56 hombres y 64 mujeres) desde las edades de 4 meses a 70 años (promedio: 15.1 años) se incluyeron en el estudio. La distribución del tipo de estrabismo reflejó lo siguiente: 63 (52.5%) tenían esotropía; 49 (40.8%) tenían exotropía; 4 (3.3%) tenían hipertropía; 3 (2.5%) presentaron exotropía e hipertropía; y 1 (0.9%) presentó esotropía e hipertropía. Esotropía y exotropía fueron significativamente ($p<0.0001$) más comunes en niños que en adultos; sin embargo, la hipertropía y los tipos combinados fueron más comunes en adultos que en niños. No hubo diferencia significativa ($p>0.05$) en la distribución de esotropía, exotropía o hipertropía entre hombres y mujeres. Conclusión: En pacientes con estos desórdenes oculares atendidos en el Centro Médico de Puerto Rico, la esotropía fue el tipo más común de estrabismo tratado quirúrgicamente. Estudios futuros evaluarán la prevalencia de estrabismo en la isla.

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